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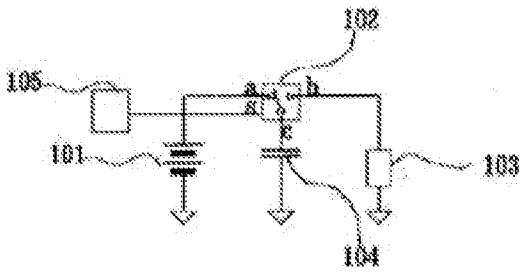
(54) LIGHT SOURCE, DISPLAY EQUIPMENT, AND ELECTRONIC DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To make dimming of light easy in addition to make a light source have high efficiency.

SOLUTION: A capacitor is periodically connected by turns with a power supply and a light-emitting element. Here, dimming is performed by changing a cycle and by changing capacity of the capacitor.



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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The figure showing the example of electric constitution of a light source concerning a 1st embodiment of this invention.
[Drawing 2]The figure showing the concrete example of 1 composition of the switching circuit 102 concerning a 1st embodiment of this invention.
[Drawing 3]The figure showing the concrete example of 1 composition of the oscillating circuit 105 concerning a 1st embodiment of this invention.
[Drawing 4]The figure showing the electric circuit composition of a light source concerning a 2nd embodiment of this invention.
[Drawing 5]The figure showing the concrete example of 1 composition of the oscillating circuit 405 concerning a 2nd embodiment of this invention.
[Drawing 6]The figure showing the electric circuit composition of a light source concerning a 5th embodiment of this invention.
[Drawing 7]The figure showing the electric circuit composition of a light source concerning a 9th embodiment of this invention.
[Drawing 8]The figure showing the electric circuit composition of the light source of conventional technology.
[Brief Description of Notations]
101 -- Power supply
102 -- Switching circuit
103 -- Light emitting device
104 -- Capacitor
105 -- Oscillating circuit
201 -- Pch field effect transistor
202 -- Nch field effect transistor

301 -- Logic inversion circuit of the Schmidt Trigger input

302 -- Capacitor

303 -- Resistor

[Translation done.]

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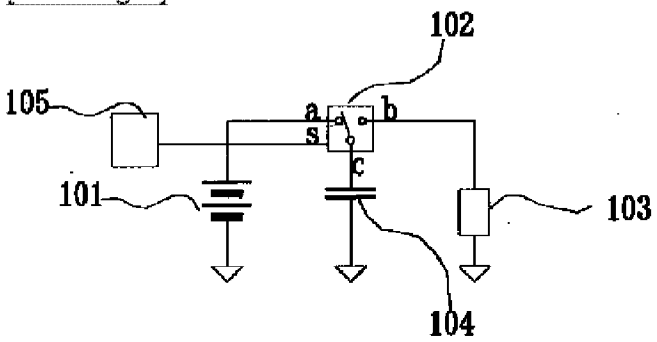
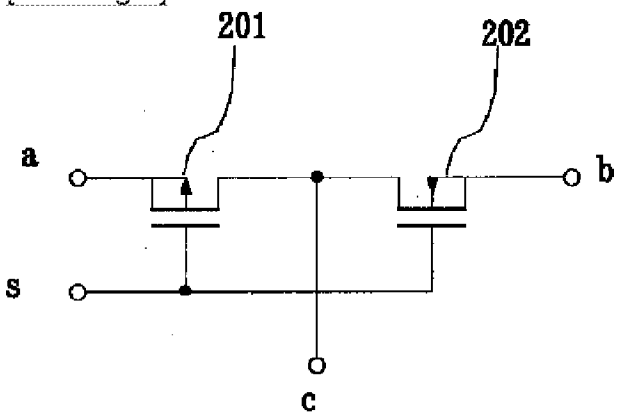
DRAWINGS

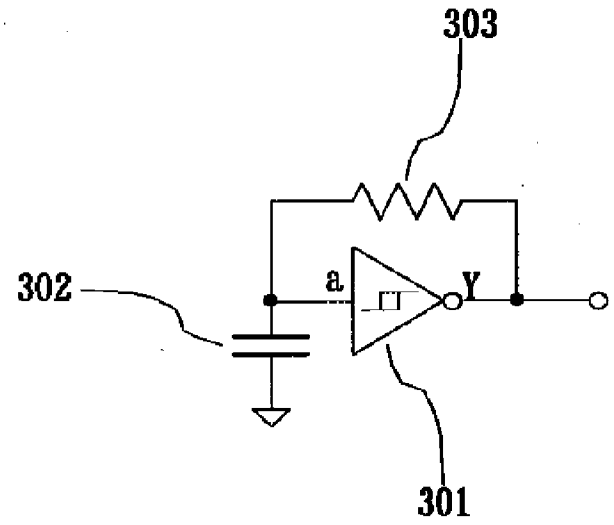
[Drawing 1]



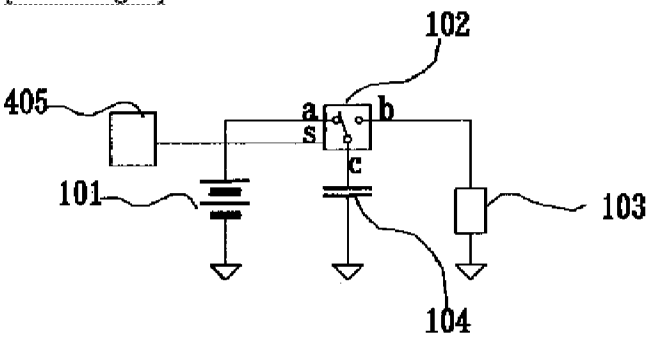
[Drawing 2]



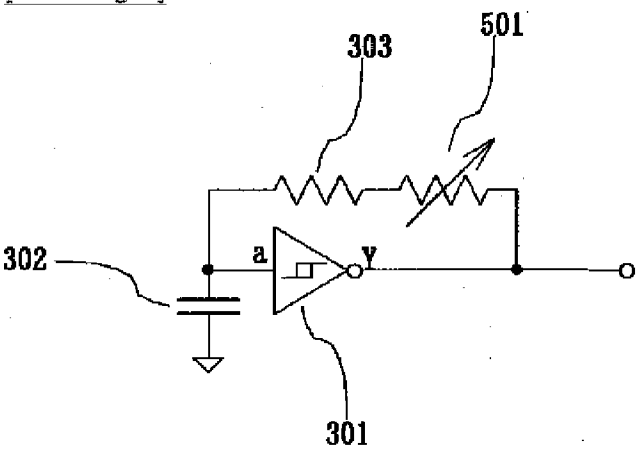
[Drawing 3]



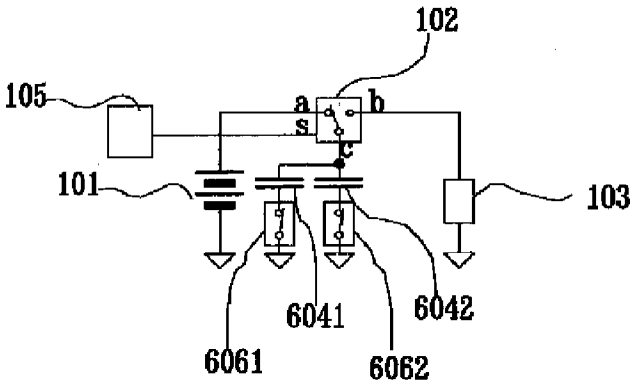
[Drawing 4]



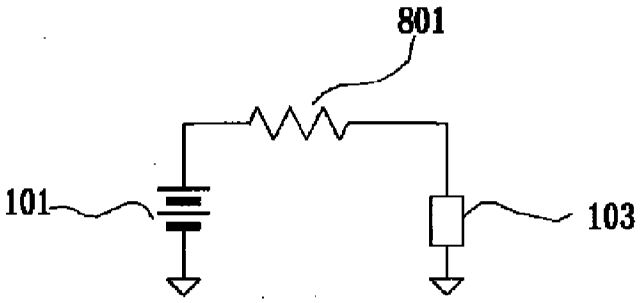
[Drawing 5]



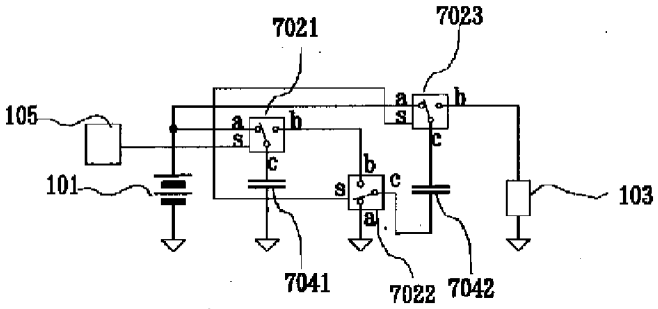
[Drawing 6]



[Drawing 8]



[Drawing 7]



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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Description of the Prior Art]In recent years, the liquid crystal display which has the feature of low power consumption by a small light weight as a display is used widely. However, unlike spontaneous light type displays, such as a cathode-ray tube (CRT), since the liquid crystal element itself does not emit light, it needs to prepare a light source for operating a liquid crystal display even in a dark place.
[0002]Although a filament lamp and a cathode-ray tube are also used as a light source, it is a light emitting diode (LED is called henceforth.) at the purpose of the formation of miniaturization efficient.Electro-luminescence (EL is called henceforth.)It is being used mostly.
[0003]If LED and EL are made to emit light by a constant voltage drive here, the current which flows with slight dispersion and ambient air temperature of these element characteristics changes a lot, therefore a luminosity is changed sharply, and it is not desirable. Therefore, generally a constant current drive is performed and the light of a predetermined luminosity is made to emit light. Drawing 8 is a figure showing the 1 circuitry example for performing this constant current drive. As for 101, a resistor and 103 are light emitting devices, such as LED and EL, a voltage source and 801 by a diagram. The light emitting device 103 is connected with the resistor 801 in series, and the voltage of the voltage source 101 is given. The voltage which big current flows through also into the resistor 801 containing in series, a voltage drop will produce and the light emitting device 103 will impress to the light emitting device 103 by it here if it is going to be alike from a predetermined value and big current tends to flow with dispersion, such as the characteristic, falls, and the increase in current is controlled. It becomes possible by using the resistor 801 as a variable resister to adjust a luminosity.
[0004]By the way, if it is in portable electronic apparatus, such as PDA (Personal Digital Assistant) and a cellular phone, a battery drive is a principle, and to be low power consumption

is demanded also about this light source. As for the light source of the display built into the portable electronic apparatus, it is preferred the strength of outdoor daylight and that in other words the light of the luminosity of a light source can be modulated according to the surrounding luminosity. It is because visibility is raised, the luminosity of a light source can be dropped and ****** can be raised by making a light source bright, when dark when this has the bright circumference. About this, it can attain by using the resistor 802 of drawing 8 as a variable resister.

[0005]

[Problem(s) to be Solved by the Invention]However, in the conventional LED or the constant current drive of EL, SUBJECT that the useless electric power which current flows into the resistor for constant-current-izing, and does not participate in luminescence in this portion is consumed occurs.

[0006]In this invention, it was made in view of the situation mentioned above.

Therefore, the place made into the purpose attains efficient-ization of a light source, and there is in providing the light source and electronic equipment which can carry out easy modulated light.

[0007]

[Means for Solving the Problem]To achieve the above objects, a light source of the 1st this invention possesses a capacitor, a power supply, a light emitting device, and the 1st switch element to which said capacitor is connected either said power supply or said light emitting device and by turns.

[0008]According to this composition, if power supply voltage is set to V and C and a change cycle of the 1st switch element are set to T for capacitor capacitance, first, it will connect with a power supply and a capacitor will charge electric charge valve flow coefficient. Next, it connects with a light emitting device and a capacitor supplies electric charge valve flow coefficient to a light emitting device. Since this is repeated 1/T times in 1 second, constant current of valve flow coefficient/T will flow into a light emitting device. At this time, since a resistor of conventional technology does not exist, useless power consumption does not occur.

[0009]A light source of the 2nd this invention Two or more capacitors, a power supply, and a light emitting device, The 2nd switch element changed to either of the states of carrying out the series connection of the state of connecting said two or more capacitors to said power supply and parallel, and said two or more capacitors, and connecting with said light emitting device, by turns is provided.

[0010]According to this composition, two capacitors connect with a power supply and parallel first, respectively, for example, and it charges to the voltage V (electric charge valve flow

coefficient). Then, the series connection of the capacitor is carried out and voltage of the both ends is set to 2V. A light emitting device is driven on this voltage. Thereby, a light emitting device can be driven also with a power supply lower than the minimum voltage required for a drive of a light emitting device. Although two capacitors explained here, if an average direct change is carried out with the arbitrary number n, it will become the voltage of the voltage nV.

[0011]Other light sources of this invention possess a periodic variable means into which a change cycle which said 1st or 2nd switch element makes connect said capacitor to either said power supply or said light emitting device by turns is made to change in a light source of the 1st thru/or 2.

[0012]According to this composition, a luminosity of a light emitting device can be adjusted now by changing the change cycle T for current (valve flow coefficient/T) which flows into a light emitting device. It is possible to make it a favorite luminosity which there is a method of performing manually as a method of changing a change cycle, and can be manually changed by user according to liking. In using for a back light of a transmission type liquid crystal display, it becomes legible by strengthening a luminosity of a light source, so that outdoor daylight is strong. Then, when outdoor daylight becomes strong, it becomes possible by shortening a change cycle automatically to use optimal luminosity. Of course, it is possible to use optimal luminosity by adjusting a change cycle with both intensity of hand control and outdoor daylight.

[0013]Other light sources of this invention possess a capacity variable means to change capacity of said capacitor or two or more of said capacitors, in a light source of the 1st thru/or 2.

[0014]According to this composition, a luminosity of a light emitting device can be adjusted now by changing C of capacity of a capacitor for current (valve flow coefficient/T) which flows into a light emitting device. It is possible to make it a favorite luminosity which there is a method of performing manually as a method of changing capacity of a capacitor, and can be manually changed by user according to liking. When outdoor daylight becomes strong, it becomes possible by enlarging capacity of a capacitor automatically to use optimal luminosity. Of course, it is possible to use optimal luminosity by adjusting capacity of a capacitor with both intensity of hand control and outdoor daylight.

[0015]And it is possible by making both a change cycle and capacitor capacitance into both both [one side or] according to hand control and outdoor daylight as using variable and its variable method as lightness adjustment to extend an adjustable range of optimal luminosity or to make it fine.

[0016]Although many kinds, such as a filament lamp, a cathode-ray tube, EL, and LED, are suitable as a light emitting device used for a light source of this invention, especially EL and LED are preferred from a low voltage, small size, a light weight, endurance, and a field of

being efficient.

[0017]Since electronic equipment of this invention is provided with a light source mentioned above, low power consumption and simplification of composition are made. A light source is used as a light source of a display, and if this display is able to include in electronic equipment of a higher rank and it pulls with a display, low power consumption of electronic equipment of a higher rank and simplification of composition are made.

[0018]As such electronic equipment, a personal computer, a cellular phone, a digital still camera, etc. are mentioned.

[0019]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described with reference to Drawings.

[0020][A 1st embodiment]

The electric constitution of the light source concerning a 1st embodiment of this invention is explained at the beginning of <composition>. Drawing 1 is a figure showing this electric circuit composition. By a diagram, as for a switching circuit and 103, 101 is [a capacitor and 105] logic oscillating circuits a light emitting device and 104 a power supply and 102. The power supply 101 outputs the voltage V. The switching circuit 102 has the terminal a, b, and c and s, and, as for the end of the power supply 101, and the terminal b, the end of a light emitting device and the terminal c are connected with the end of the capacitor 104 for the terminal a. The other end of the power supply 101, the capacitor 104, and the light emitting device 103 is grounded by common electric potential. (The inside of a figure, ** sign) The terminal s of the switching circuit 102 is an input terminal, and inputs the output signal of the logic oscillating circuit 105. The logic oscillating circuit 105 outputs the clock signal of a binary. Inner one value of a binary is set to L, the value of another side is set to H, and the switching circuit 102 makes it flow through the terminals a and c, and makes it flow through the terminals c and b here at the time of H at the time of the signal of L. Although many kinds, such as a filament lamp, a cathode-ray tube, EL, and LED, of light emitting devices are applicable as the light emitting device 103, especially EL and LED are preferred from the low voltage, small size, a light weight, endurance, and the field of being efficient. Here, LED is used. Here, the concrete example of 1 composition of the switching circuit 102 is shown in drawing 2. By a diagram, the terminal a, b, and c and s correspond to each terminal of the switching circuit 102 of drawing 1. 201 of drawing 2 is a field effect transistor (FET is called henceforth.) of Pch, and 202 is FET of Nch. The sauce of FET201 and the terminal b are connected with the sauce of FET202, and, as for the terminal c, the terminal a is connected with FET201 and the drain of both 202. And the terminal s is connected with FET201 and the gate of both 202. Therefore, if the potential of the terminal s becomes lower than the terminal a and becomes the following near the potential of the terminal b, FET201 will flow and FET202 will be un-flowing. On the contrary, if the

potential of the terminal s becomes higher than the terminal b and becomes the above near the potential of the terminal a, FET202 will flow and FET201 will be un-flowing.

[0021]Next, the concrete example of 1 composition of the oscillating circuit 105 of drawing 1 is shown in drawing 3. By a diagram, the capacitor in which, as for 301, the Schmidt Trigger type logic inverting circuit and 302 have the capacity Cosc, and 303 are resistors with the resistance Rosc. Here, one end of a capacitor is grounded by a certain potential, and the other end is connected to the input a of the logic inverting circuit 301. One end of the resistor 303 is connected to the input a of the logic inverting circuit 301, and the other end is connected to the output Y of the logic inverting circuit 301. It has such composition and the clock signal of the cycle mostly proportional to the product of Rosc and Cosc is outputted. The oscillating frequency f "Hz" at this time is expressed with f= 1/T when a cycle is set to T.

[0022]The light source of a 1st embodiment has the above composition.

[0023]<Operation> Operation is explained below. First, since the switching circuit 102 makes it flow through the terminals a and c when the output of the oscillating circuit 105 of drawing 1 is in the state of L, the capacitor 104 is charged on the voltage V of the power supply 101. That is, electric charge valve flow coefficient is stored in the capacitor 104. The period which makes it flow through the terminals a and c needs to be a period when an electric charge is fully stored in the capacitor 104. Conversely, if it says, the capacity value of the capacitor 104 needs to be a value which can charge an electric charge enough within the period through which the terminals a and c have flowed.

[0024]Next, since the switching circuit 102 makes it flow through the terminals b and c when the output of the oscillating circuit 104 will be in the state of H, the capacitor 104 emits electric charge valve flow coefficient to the light emitting device 103. That is, current flows into the light emitting device 103. Here, current continues flowing until the voltage which a light emitting device impresses in the case of a filament lamp etc. is set to 0, but if it becomes below a certain impressed electromotive force (it is considered as the voltage VF) in the case of LED, current will not flow. Therefore, the charge quantity which the capacitor 104 emits is set to C (V-VF). The period which makes it flow through the terminals b and c needs to be only a period when the electric charge collected on the capacitor 104 is fully emitted. Conversely, if it says, the capacity value of the capacitor 104 and the resistance of the light emitting device 103 need to be values which can emit an electric charge enough from a capacitor within the period through which the terminals b and c have flowed.

[0025]Since this is repeated f times in 1 second, average current is set to C(V-VF) f. Here, the electric power consumed is only the light emitting device 103, and the useless power consumption of it is lost. As for the oscillating frequency f of the logic oscillating circuit 104, since a flicker will arise if not much low, not less than 30 Hz is preferred in it being low, and it is more preferably set as not less than 50 Hz. As long as the concrete example of composition of

the switching circuit 102 and the oscillating circuit 105 explained here makes it easy to embody this invention, does not limit it to this composition and suits the meaning of this Description, what kind of composition may be sufficient as it.

[0026][A 2nd embodiment] As a 1st embodiment of <composition> explained, the average current which flows into a light emitting device is prescribed by C(V-VF) f, and is proportional to the frequency f. Therefore, by changing the change frequency f of the switching circuit 102, the average current which flows into a light emitting device can be adjusted, and modulated light becomes possible. This is explained by a diagram here. Drawing 4 is a figure showing the electric constitution of the light source concerning a 2nd embodiment of this invention. By a diagram, except 405, since the same composition and operation as drawing 1 are carried out, the same number is attached and duplication of explanation is avoided. 405 is the oscillating circuit which was made to change frequency of the clock signal. Drawing 5 is a figure showing the concrete example of 1 composition of the logic oscillating circuit 405. Since the same composition and operation as the logic oscillating circuit 105 of drawing 3 are carried out by drawing 5 except 501, the same number is attached and explanation is omitted. 501 is a variable resister, and it is inserted so that a series connection may be carried out to the resistor 303 between the input of the inverting circuit 301, and an output.

[0027]changing the resistance of the variable resister 501 of drawing 5 manually, for example, since it has composition beyond <operation> -- it can change, the average current which flows into the light emitting device 103 according to it can change, and the light of the oscillating frequency of the oscillating circuit 405 of drawing 4 can be modulated to the optimal luminosity.

[0028]Here, a fixed register may be added if needed in parallel between the input of the variable resister 501 or the inverting circuit 301, and an output. Thereby, a light control range and the ease of carrying out of modulated light can be made proper.

[0029]As mentioned above, in other words, the light can be easily modulated only by making a variable resister add, and efficient-ization can be attained like a 1st embodiment as oscillating frequency is changed.

[0030][A 3rd embodiment] In addition in the light source of a 2nd embodiment, the optical sensor elements from which resistance changes with the surrounding luminosity, i.e., the strength of outdoor daylight, can be used instead of the variable resister 501 of drawing 5. As such an element, there are photoconductive elements, such as a sulfuration KADONIUMU (CdS) cell. This element has the character in which that resistance becomes small, if the light equivalent to this element becomes strong. Therefore, since resistance will become low if the strength of outdoor daylight becomes strong, the oscillating frequency f of the oscillating circuit 501 becomes so high that outdoor daylight becomes strong, a light emitting device becomes brighter, and when outdoor daylight is weak, a light emitting device becomes dark and is

automatically adjusted to the optimal luminosity.

[0031][A 4th embodiment] In the light source of a 2nd embodiment, optical sensor elements are connectable with the variable resister 501 of drawing 5 in series or in parallel again. Thereby, the automatic dimming by manual modulated light and outdoor daylight becomes possible [modulating the light to the luminosity more nearly optimal than a possible next door].

[0032]This embodiment may also add a fixed register in parallel, while the fixed register 303 which intervenes between the input of the inverting circuit 301 and an output, the variable resister 501, and optical sensor elements are arbitrary. The ease of carrying out of the modulated light which includes a light control range and an automatic regulation by this can be made proper.

[A 5th embodiment] As a 1st embodiment explained, the average current which flows into the light emitting device 103 is set to C(V-VF) f. Therefore, even if it changes the capacity C of the capacitor 104 of drawing 1, the average current which flows into the light emitting device 103 changes, and a luminosity changes. Therefore, the light can be modulated.

[0033]<Composition> drawing 6 is a figure showing the electric circuit composition of the light source of a 5th embodiment. By a diagram, the composition and operation of those other than 6041, 6042, 6061, and 6062 attach the same number similarly to drawing 1, and omit explanation. 6041 and 6042 are capacitors with the capacity of c1 and c2, respectively, and 6061 and 6062 are switching circuits and are switches which connect or intercept the capacitors 6041 and 6042 with a certain potential, respectively.

[0034]Since it has composition beyond <operation>, if the switching circuit 6061 uses a flow and 6062 makes it a cut off state (this is changed into the state 1.), the average current which flows into a light emitting device will be set to c1 (V-VF)f. Next, if the switching circuit 6061 uses interception and 6062 makes it switch-on, the average current which flows into a light emitting device will be set to c2 (V-VF)f. And if both the switching circuits 6061 and 6062 are made into switch-on, the average current which flows into a light emitting device will be set to f (V-VF (c1+c2)). Therefore, modulated light of a three-stage is attained by making c1 and c2 into different capacity. If the capacity of a capacitor is set up so that it may be especially set to c2=2c1, average current can be set as 1 time, twice, 3 times, and regular intervals, when the average current of the state 1 is set to 1.

[0035]Although the switching circuits 6061 and 6062 are inserted in both capacitors 6041 and 6042 in this embodiment, one side may always be grounded.

[0036]It does not limit to this and, of course, this embodiment is available for at least three or more, although it is considered as two numbers, a capacitor and the capacitor corresponding to this. And although each capacity of these capacitors may be arbitrary, the twice of minimum capacity, 4 times, 8 times, and the exponentiation of 2 are used, and it becomes possible to

set up average current at equal intervals by choosing the capacitor grounded suitably.

[0037][A 6th embodiment] In a 5th embodiment, ON-and-OFF control of the switching circuits 6061 and 6062 may be controlled by outdoor daylight. That is, the intensity of outdoor daylight may be perceived with arbitrary photosensors, this may be changed into a digital variable in an analog-to-digital circuit, and the switching circuits 6061 and 6062 may carry out ON-and-OFF control according to the state of each bit. Thereby, the same effect as a 3rd embodiment is acquired.

[0038][A 7th embodiment] In a 5th embodiment, ON-and-OFF control of the switching circuit 6061 may be controlled by outdoor daylight like a 6th embodiment, and ON-and-OFF control of the switching circuit 6062 may be made into hand control. Thereby, the same effect as a 4th embodiment is acquired. Of course, also in this embodiment, the number and capacity of a capacitor may be arbitrary.

[0039][An 8th embodiment] The method whose light is modulated by changing the change cycle of the switching circuit 102 by the embodiment of the 2nd thru/or 4 was described, and the method whose light is modulated by changing the capacity of a capacitor by the embodiment of the 5th thru/or 7 was described. The composition of changing the change cycle of the switching circuit 102, and changing the capacity of a capacitor here may be used. Since it is made to only compound and an above-mentioned embodiment can be easily embodied about this composition, do not give detailed explanation, but. For example, using the way rough modulated light changes the capacity of a capacitor, when fine modulated light uses the method of changing a change cycle, fine modulated light is attained at a large area. And a part may be manually made the modulated light according to outdoor daylight of a part if needed, and this can also be embodied easily.

[0040][A 9th embodiment] Although a 1st embodiment showed the example using LED as a light emitting device, as the power supply 101, to VF of LED, current does not flow into LED and, in V<VF, it does not function as a light source by the cell of the low voltage V, etc. This embodiment shows the electric constitution of the light source which functions also with the power supply voltage below the minimum voltage required for a light emitting device in this way.

[0041]<Composition> drawing 7 is a figure showing the electric constitution of the light source of this embodiment. The power supply 101, the light emitting device 103, and the oscillating circuit 105 carry out the same operation by a diagram similarly to what attached the jack per line of drawing 1. A switching circuit, and 7041 and 7042 are the capacitors of the capacity C 7021, 7022, and 7023 of drawing 7. The switching circuits 7021, 7022, and 7023 have the terminal a, b, and c and s, respectively. And all the terminals s of the switching circuits 7021, 7022, and 7023 are connected with the output of the oscillating circuit 105, and when the output signal of the oscillating circuit 105 is a signal of L, the switching circuits 7021, 7022, and

7023 make it flow through the terminals a and c, and make it flow through the terminals c and b at the time of H. Here, as for the end of the power supply 101, and the terminal b, it connected with the end of the capacitor 7041 and the terminal b and the terminal c of the switching circuit 7022 have connected the terminal c of the switching circuit 7022 with the end of the capacitor 7042 for the terminal a of the switching circuit 7021. The terminal c of the switching circuit 7023 is connected with the other end of the capacitor 7042, the terminal a is connected with one end of the power supply 101, and the terminal b is connected with one end of the light emitting device 103. The other end of the power supply 101 and the other end of the terminal a of the switching circuit 7022 and the light emitting device are grounded by a certain common electric potential (sign **). It has the above composition.

[0042]<Operation> Operation is explained below. First, since the switching circuits 7021, 7022, and 7023 make it flow through the terminals a and c when the output of the oscillating circuit 105 is L, as for one end of the capacitor 7041, the power supply 101 and the other end are grounded, and, as for one end of the capacitor 7042, the power supply 101 and the other end are grounded in a similar manner. Therefore, it is connected with the power supply 101 in parallel, and the capacitors 7041 and 7042 charge the capacitors 7041 and 7042 on the voltage V. Next, since it is made to flow through the switching circuits 7021 and 7022 and each terminals b and c of 7023 ** when the output of the oscillating circuit 105 will be in the state of H, It becomes a series connection, the voltage of the two capacitors 7041 and 7042 is set to 2V, and this voltage impresses the capacitors 7041 and 7042 to the light emitting device 103. Here, if it becomes 2 V>VF (>V), the charge quantity which the capacitors 7041 and 7042 emit will be set to C (2 V-VF). Since this is repeated f times in 1 second, average current is set to C (2 V-VF) f.

[0043]it is possible to make it function as a light source also with the power supply voltage below the minimum voltage required for a light emitting device as mentioned above -- since there is both no useless power consumption like a 1st embodiment, it is efficient. Although the average direct change of the two capacitors was carried out and the voltage of 2V was obtained in this embodiment, it cannot be overemphasized that it is possible to carry out the average direct change of the capacitor of the arbitrary number n, and to obtain the voltage of nV.

[0044]Depending on a light emitting device, the high voltage impression of luminous efficiency may be better, and, also in the case of V>VF, this embodiment may be used.

[0045]There is effect that the control means of the embodiment of the 2nd thru/or 8 is applicable and same like a 1st embodiment.

[0046][A 10th embodiment] By using the <display> above-mentioned light source for light sources, such as a back light of a liquid crystal display, the power consumption as a liquid crystal display is reduced. Since modulated light is easy, the good display of visibility is

obtained.

[0047][An 11th embodiment] The power consumption as electronic equipment is reduced by building the <electronic equipment> above-mentioned display into electronic equipment. A legible display is made and the product quality of electronic equipment can be raised.

[0048]As such electronic equipment, the monitor of a personal computer, a portable telephone, a digital still camera, a liquid crystal television, and video recording apparatus, etc. are mentioned.

[0049]

[Effect of the Invention]As explained above, an efficient light source is obtained and it comes to be able to do modulated light easily according to this invention.

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CLAIMS

[Claim(s)]
[Claim 1]A light source possessing a capacitor, a power supply, a light emitting device, and the 1st switch element to which said capacitor is connected either said power supply or said light emitting device and by turns.
[Claim 2]A light source possessing the 2nd switch element changed to either of the states of carrying out the series connection of two or more capacitors, a power supply, a light emitting device, the state of connecting said two or more capacitors to said power supply and parallel, and said two or more capacitors, and connecting with said light emitting device, by turns.
[Claim 3]one of Claims 1-2 to which said 1st or 2nd switch element is characterized by providing a periodic variable means into which a change cycle which connects said capacitor by turns to either said power supply or said light emitting device is made to change -- a light source of a description.
[Claim 4]A light source, wherein said periodic variable means changes said change cycle manually in the light source according to claim 3.
[Claim 5]A light source, wherein said variable means changes said change cycle in the light source according to claim 3 according to strength of outdoor daylight.
[Claim 6]A light source, wherein said variable means changes said change cycle in the light source according to claim 3 according to strength of hand control and outdoor daylight.
[Claim 7]one of Claims 1-2 possessing a capacity variable means to change capacity of said capacitor or two or more of said capacitors -- a light source of a description.
[Claim 8]A light source, wherein said capacity variable means changes capacity of said capacitor or two or more of said capacitors manually in the light source according to claim 7.
[Claim 9]A light source, wherein said capacity variable means changes capacity of said capacitor or two or more of said capacitors in the light source according to claim 7 according to strength of outdoor daylight.

[Claim 10]A light source, wherein said capacity variable means changes capacity of said capacitor or two or more of said capacitors in the light source according to claim 7 according to strength of hand control and outdoor daylight.

[Claim 11]one of Claims 1-2 possessing said periodic variable means and said capacity variable means -- a light source of a description.

[Claim 12]A light source changing capacity of said change cycle, said capacitor, or two or more of said capacitors in the light source according to claim 11 according to strength of hand control or outdoor daylight about at least one variable means of said periodic variable means and said capacity variable means.

[Claim 13]one of Claims 1-12, wherein said light emitting device is a light emitting diode or electro-luminescence -- a light source of a description.

[Claim 14]Electronic equipment which makes it the feature to have provided the light source according to claim 1 to 13.

[Claim 15]A display which makes it the feature to have provided the light source according to claim 1 to 13.

[Claim 16]Electronic equipment which makes it the feature to have provided the display according to claim 15.

[Field of the Invention]This invention relates to the light source used for the back light of a liquid crystal display, etc., for example.

[Translation done.]